**SMART-DINE (A Restaurant Table Order Management System Based on Android)**

**BY**

**Tasmima Sultana Reya**
**ID: 171-15-8743**
**AND**

**Udoy Deb Das**
**ID: 171-15-8658**
**AND**

**Taj Ul Islam Rinku**
**ID: 171-15-8825**

This Report Presented in Partial Fulfillment of the Requirements for the Degree of Bachelor of Science in Computer Science and Engineering

Supervised By

**Mst. Eshita Khatun**
Lecturer
Department of CSE
Daffodil International University

Co-Supervised By

**Fahad Faisal**
Assistant Professor
Department of CSE
Daffodil International University

**DAFFODIL INTERNATIONAL UNIVERSITY**

**DHAKA, BANGLADESH**

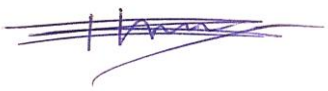
**9th SEPTEMBER 2021**

# APPROVAL

This Project titled "**SMART-DINE**", submitted by **Tasmima Sultana Reya**, ID No: **171-15-8743** and **Udoy Deb Das,** ID No: **171-15-8658** and **Taj Ul Islam Rinku,** ID No: **171-15-8825** to the Department of Computer Science and Engineering, Daffodil International University, has been accepted as satisfactory for the partial fulfillment of the requirements for the degree of B.Sc. in Computer Science and Engineering and approved as to its style and contents. The presentation has been held on 9th September, 2021.

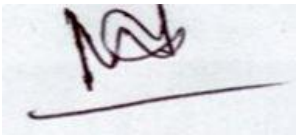
## BOARD OF EXAMINERS

**Chairman**

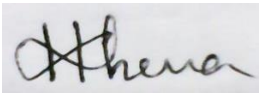


**Dr. Touhid Bhuiyan**
**Professor and Head**
Department of Computer Science and Engineering
Faculty of Science & Information Technology
Daffodil International University

**Internal Examiner**



**Dr. Md. Ismail Jabiullah**
**Professor**
Department of Computer Science and Engineering
Faculty of Science & Information Technology
Daffodil International University



**Internal Examiner**

**Most. Hasna Hena**
**Assistant Professor**
Department of Computer Science and Engineering
Faculty of Science & Information Technology
Daffodil International University

**External Examiner**

**Dr. Dewan Md. Farid**
**Associate Professor**
Department of Computer Science and Engineering
United International University

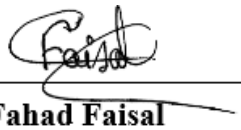
# DECLARATION

We hereby declare that; this project has been done by us under the supervision of **Mst. Eshita Khatun, Lecturer, Department of CSE** Daffodil International University. We also declare that neither this project nor any part of this project has been submitted elsewhere for award of any degree or diploma.

**Supervised by:**

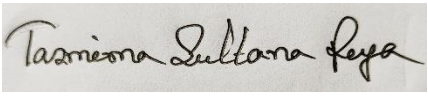
**Mst. Eshita Khatun**
Lecturer
Department of CSE
Daffodil International University

**Co-Supervised by:**



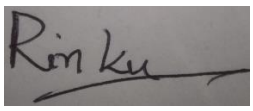
**Fahad Faisal**
Assistant Professor
Department of CSE
Daffodil International University

**Submitted by:**



**Tasmima Sultana Reya**
ID: 171-15-8743
Department of CSE
Daffodil International University

**Udoy Deb Das**
ID: 171-15-8658
Department of CSE
Daffodil International University



**Taj Ul Islam Rinku**

ID: 171-15-8825
Department of CSE
Daffodil International University

# ACKNOWLEDGEMENT

Firstly, we express our heartiest thanks and gratefulness to almighty God for His divine blessing makes us possible to complete the final year project successfully.

We really grateful and wish our profound our indebtedness to **Mst Eshita Khatun, Lecturer**, Department of CSE Daffodil International University, Dhaka. Deep Knowledge & keen interest of our supervisor in the field of "*Restaurant automation system*" to carry out this project. Her endless patience, scholarly guidance, continual encouragement, constant and energetic supervision, constructive criticism, valuable advice, reading many inferior drafts and correcting them at all stage have made it possible to complete this project.

We would like to express our heartiest gratitude to **Dr. Touhid Bhuiyan, Professor** and Head**,** Department of CSE, for his kind help to finish our project and also to other faculty member and the staff of CSE department of Daffodil International University.

We would like to thank our entire course mate in Daffodil International University, who took part in this discuss while completing the course work.

Finally, we must acknowledge with due respect the constant support and patients of our parents.

# ABSTRACT

We present an android-based restaurant automation system in this study. The project's major goal is to make restaurant management easier and reducing human touch. The ordering and delivery of food products is now done manually in most restaurants; the downsides are that it takes a lot of time, and in some situations, clients aren't delivered the proper item at the right time, which causes a lot of problems. As a result, we decided to use modern electrical technologies to automate this procedure. Each table in the restaurant is equipped with a touch screen that represents each distinct digital menu and simplifies ordering. In the digital menu, the customer can examine all of the available food items, along with their prices, and choose one. Each table's order is wirelessly transmitted to the kitchen through Bluetooth. The electronic menu system allows visitors to choose meals from a rolling screen on an Android touch screen, as well as check the cost and most recent availability of food items, as well as display table numbers. The hotel personnel may read the items from each table using a thermal printer that takes the bill from the kitchen. When the meal is ready in the kitchen, an LED glow can be displayed at the appropriate client table.

# TABLE OF CONTENTS


| CONTENTS | PAGE |
|---|---|
| Approval | i-ii |
| Declaration | iii-iv |
| Acknowledgement | v |
| Abstract | vi |
| Table of Content | vii-viii |
| List of Figures | ix-x |
| List of Tables | xi |
| **CHAPTERS** | |
| **Chapter 1: Introduction** | **1-2** |
| 1.1 Introduction | 1 |
| 1.2 Motivation | 1 |
| 1.3 Objectives | 1 |
| 1.4 Expected Outcome | 1 |
| 1.5 Report Layout | 2-3 |
| **Chapter 2: Background** | **4-6** |
| 2.1 Introduction | 4 |
| 2.2 Related Works | 4 |
| 2.3 Comparative Studies | 4-5 |
| 2.4 Scope of the Problem | 6 |
| 2.5 Challenges | 6 |

**Chapter 3: Requirement Specification** **7-11**

3.1 Business Process Modeling 7-8

3.2 Requirement Collection and Analysis 9

3.3 Use Case Modeling and Description 10

3.4 Logical Data Model 11

3.5 Design Requirements 11

**Chapter 4: Design Specification** **12-16**

4.1 Front-end Design 12

4.2 Back-end Design 13

4.3 Interaction Design and UX 14-16

4.4 Implementation Requirements 16

**Chapter 5: Implementation and Testing** **17-30**

5.1 Implementation of Database 17

5.1.1 Database authentication 18

5.2 Implementation of Front-end Design 19-27

5.3 Implementation of Interactions 28-30

5.4 Test Results and Reports 31

**Chapter 6: Conclusion and Future Scope** **32-33**

6.1 Discussion and Conclusion 32

6.2 Scope for Further Developments 33-33

**References** **34**

# LIST OF FIGURES


| FIGURES | PAGE NO |
|---|---|
| Figure 3.1.1: Business Process Modeling | 7 |
| Figure 3.1.2: Business Process Modeling | 8 |
| Figure 3.2.1: Requirement Collection and Analysis | 9 |
| Figure 3.3.1: Use Case Modeling and Description | 10 |
| Figure 3.4.1: Logical Data Model | 11 |
| Figure 4.1.1: Front-end Design (User) | 12 |
| Figure 4.1.2: Front-end Design (Admin) | 12 |
| Figure 4.2.1: Back-end Design | 13 |
| Figure 4.3.1: Interaction Design and UX (Menu bar) | 14 |
| Figure 4.3.2: Interaction Design and UX (Order Confirmation) | 15 |
| Figure 4.3.3: Interaction Design and UX (Home Page) | 16 |
| Figure 5.1.1: Implementation of database | 17 |
| Figure 5.2.1: Registration Page View | 18 |
| Figure 5.2.2: Login View (User) | 19 |
| Figure 5.2.3: Login View (Admin) | 19 |
| Figure 5.2.4: Home View | 20 |
| Figure 5.2.5: Menu Bar View | 21 |
| Figure 5.2.6: Restaurant Page View | 22 |
| Figure 5.2.7: Order Confirmation Page View | 23 |
| Figure 5.2.8: Payment method page view | 24 |
| Figure 5.2.9: QR code scanner View | 25 |
| Figure 5.2.10: About Us Page View | 26 |
| Figure 5.3.1: Password and Confirm Password Error | 27 |
| Figure 5.3.2: Add new restaurants and menu page | 28 |
| Figure 5.3.3: Restaurant adding process | 29 |

Figure 5.4.1: View Orders and booking (Admin) View 30
Figure 5.4.2: User Info & Management (Admin) View 30

# LIST OF TABLES


| TABLES | PAGE NO |
|---|---|
| Table 1: Comparative studies between our app and recently using apps | 5 |

# CHAPTER 1
# Introduction

## 1.1 Introduction

Smart-Dine is a healthy solution for people who enjoy eating food at a restaurant. It has an app which allows the user to order food and the app is also provided with a digital payment system. Every table at the restaurant will have a tablet which will be able to show menu and take order [1]. This will help both the customers and the restaurant as, the continuous business will keep the restaurant running, the customers will be more interested because of the smart new elements.

## 1.2 Motivation

The main purpose of our project is to make the restaurant system more easily adaptable and safely accessible.

For customers using an application on their smart phone rather than a handed down menu is safer which is the main objective of our project.

## 1.3 Objectives

SMART-DINE is developed to reduce human touch. To make social distancing and safety for people from Covid-19 and other flu. It attempts to digitalize the ordering, billing, cooking, hall, and inventory management processes in diverse restaurant operations. The major goal is to increase the restaurant's performance by eliminating everyday paperwork and human touch. On the other hand, to create a new possibility to find the balance between health and profit as the profit is the same while health is maintained by reducing the human touch and transferring the virus.

## 1.4 Expected Outcome

Our main objective is to provide the restaurant industry and the customers with the best way to co-operate together with the help of our system. We eagerly hope that, customers will be able to get a safe, satisfactory and responsive service while using this system in a restaurant.

## 1.5 Report Layout

### Chapter 1: Introduction

This chapter describes work inspiration, motivation, project objective and outturn of the program.

### Chapter 2: Background

The background is important and this chapter discusses the background related work such as comparison with other projects and finds out the problem of the project, the challenges which are face to do the project.

### Chapter 3: Requirement Specification

This chapter defines many important things of the project are requirements such as the use case model, business process modeling and the logical database.

### Chapter 4: Design Specification

The purpose of this chapter is the design of the project. Two types of design which are front-end design and back-end design for this project. The proper implementation of the design is very important which describes this chapter in detail.

## Chapter 5: Implementation and Testing

This chapter shows the implementation and testing system of the project by the project screenshot. After completion of any project, testing data and its success tell is the project ready to live.

## Chapter 6: Conclusion and Future Scope

Every project has some limitation and how it can be overcome and also the future implementation scope is discussed in this chapter.

# CHAPTER 2

# Background

## 2.1 Introduction

In this modernized world, the medical industry is way more advanced and stronger but the diseases and viruses are also becoming stronger as well. COVID-19 is an example which follows that statement. So, to minimize the risks of getting effected while keeping the regular life as regular as possible, we developed a system named Smart-Dine. Smart-Dine will help customers by keeping the human-to-human interaction as low as possible if not fully eliminating the possibility.

## 2.2 Related Works

SMART-DINE is an application that is used to assist users in obtaining online services. Customers will benefit from this endeavor. There is no app like 'SMART-DINE' in Bangladesh. However, some of the capabilities of SMART-DINE are comparable to those found in other online applications. Foodpanda, Munchies, Pathao food etc. and others are among them.

## 2.3 Comparative studies

In most cases, the application is created to achieve a certain goal. It may appear that an application has certain common titles, however distinct aspects may exist. The most comparable applications, such as this system, are listed below. –

TABLE 1: COMPARATIVE STUDIES BETWEEN OUR APP AND RECENTLY USING APPS

| Name | Their work principle | Our work principle |
|---|---|---|
| Food panda | • Food panda is an independent food ordering app having direct link to restaurants.<br>• Their main principle is to deliver food from restaurant to home. | SMART-DINE provides restaurant booking system. Customer can book their desired table before they go to the restaurant. |
| Pathao Food | Pathao food also a home delivery food ordering app. It is quite similar to food panda. It does not have a function which is the food panda has. This function is grocery item ordering system. | Our app does not have home delivery option. The reason behind this, our app will be fully automated. There will be no human interaction between the customer and the authority. We are planning about a serving robot, which will serve the food on customer table. |
| Munchies | Munchies.com is a late-night food ordering system. As well as it works as a warehouse of variety of products and restaurants. It does not have any android application. | The main principle of our application is to reduce human touch because of this Covid-19 pandemic as well as some other contagious flues. For this an AI assistant and a serving robot will be developed for doing that works which are done by the humans. |

## 2.4 Scope of the problem

This system can reduce human interaction to minimum as the system still has some place to improve. That being said, users will need to co-operate as the system will attract attention without any doubt but if they are not willing to follow the rules for not getting effected then the safety of the individual can be compromised.

## 2.5 Challenges

We have faced a lot of challenges while developing this system. We tried to give our best and hoped for the best.

i. Lack of time was very challenging as; due to physical conditions we could not work for the most of the time.
ii. Lack of proper communication was the most challenging due to poor internet connection and mobile network.
iii. Inexperience in a few topics like,
    - Android dependency,
    - Firebase authenticity,
    - Real time database,
    - Connecting real time database and Android studio,
    - QR code generation,
    - QR code data input,
    - Connecting the QR code scanner to the android application.

# CHAPTER 3

# Requirement Specification

## 3.1 Business Process Modeling

The graphical representation of a company's business processes or workflows as a way of discovering potential changes is known as business process modeling. Flowcharts, data-flow diagrams, and other graphing approaches are commonly used to do this [3]. Now we will discuss the Business Process Modeling. It will describe the works for each character.

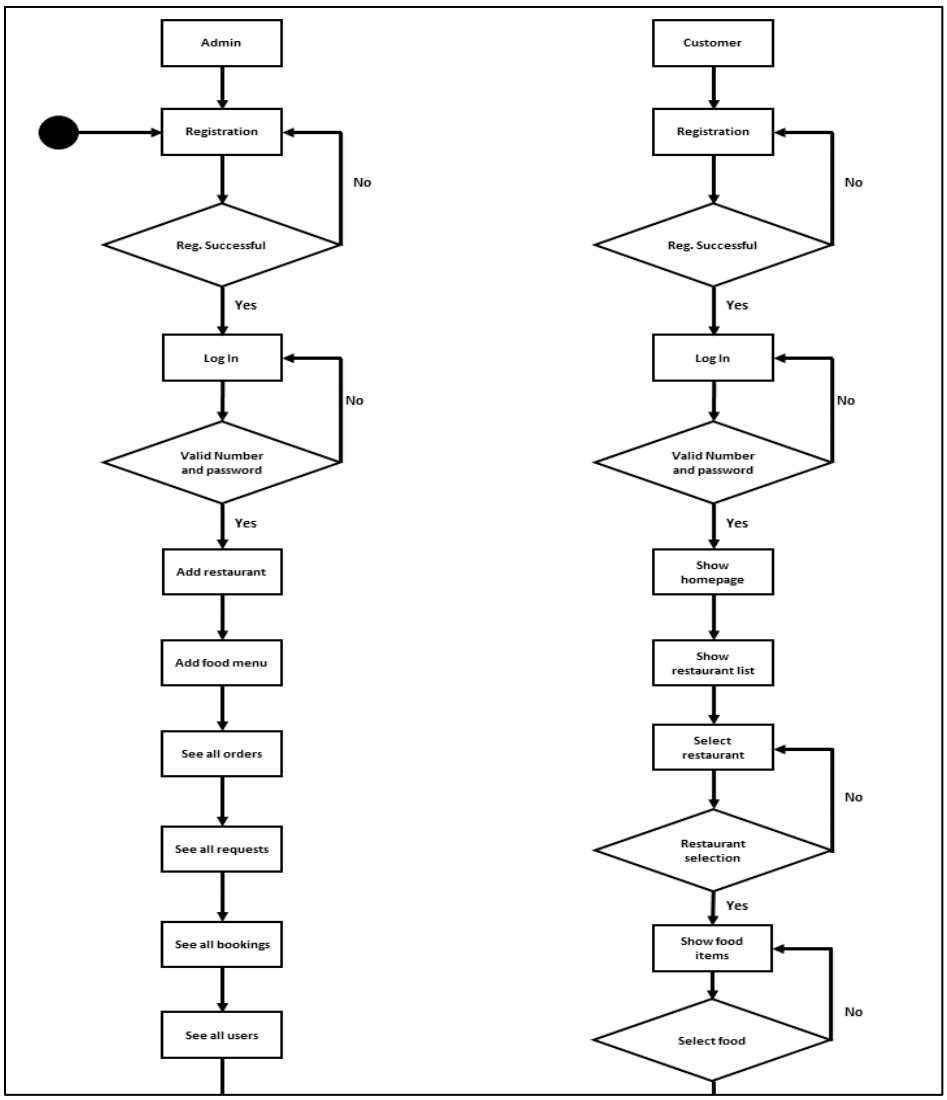



Figure 3.1.1: Business Process Modeling

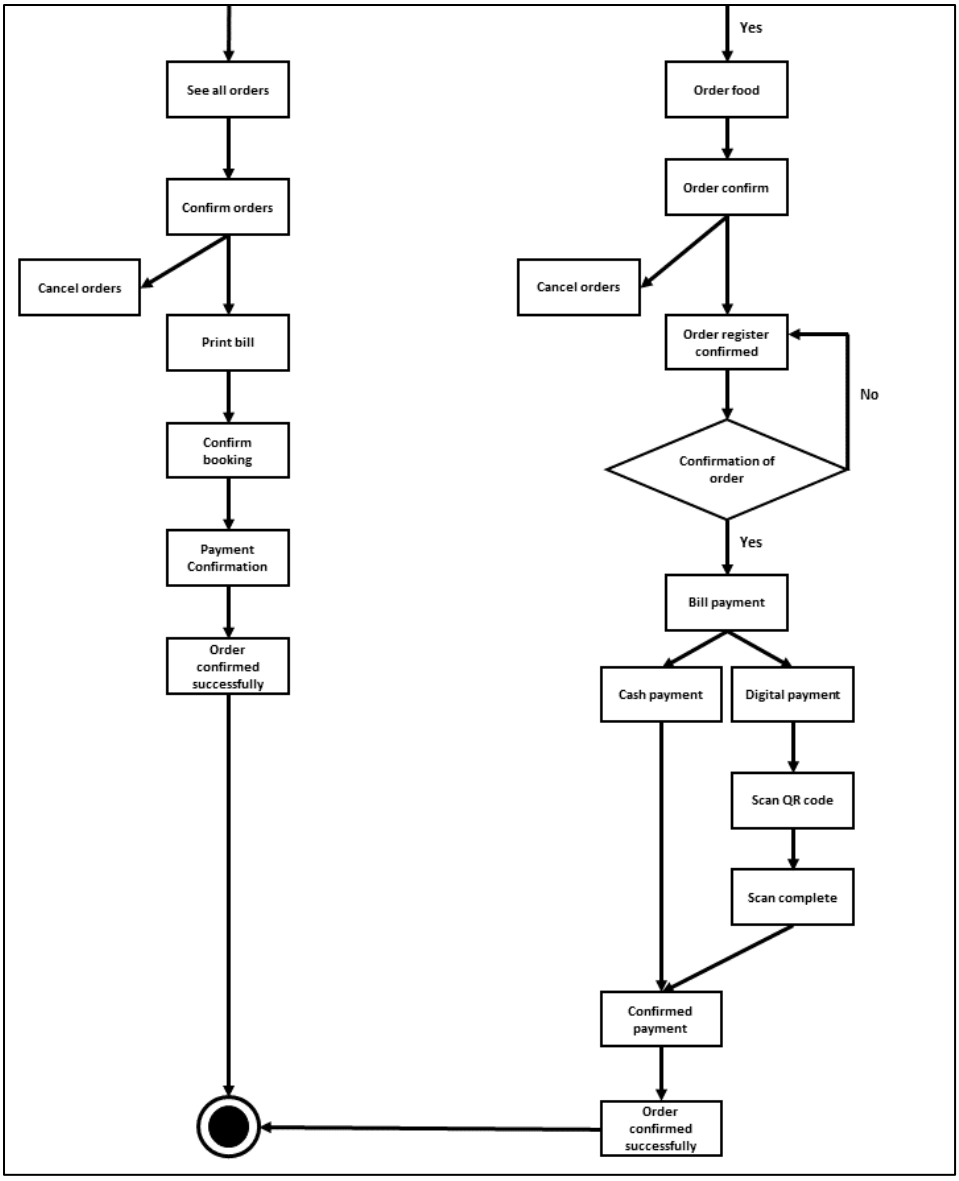



Figure 3.1.2: Business Process Modeling

In these above pictures we presented our business process model for our app. This figure shows that both admin and customer need registration first. After that they can do login in the system. After successful log in customer can see restaurant list, food item list. He also can order food and booking table by paying bills online or offline. On the other hand, admin can manage all the system.

## 3.2 Requirement Collection Analysis

The tasks that go into determining the needs or conditions to meet for a new or altered product or project, taking into account the potentially conflicting requirements of various stakeholders, analyzing, documenting, validating, and managing software or system requirements are all included in requirements analysis. Here only admin has the power to create data like restaurant, user role and others. After taking order from the customer the others will be given their assigned task and they will complete the task.

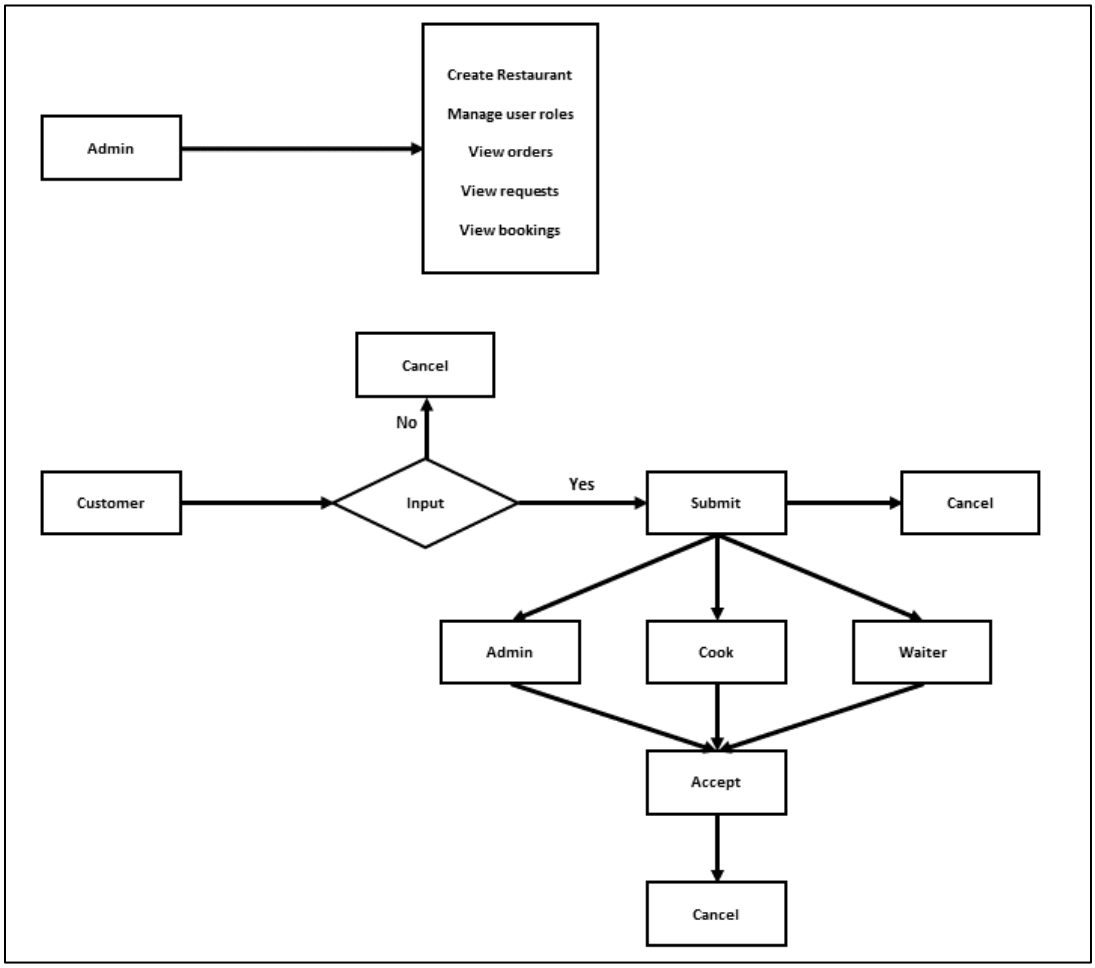



Figure 3.2.1: Requirement Collection Analysis

The above figure shows us requirement collection analysis. For the development of our project, we need the above requirements.

### 3.3 Use Case Modeling and Description

The use case model shows us how different types of people or, user works or, uses the system to solve a problem. At first, admin has to do registration. Then admin has to login in the system. After that, he can add restaurant, food item, manage users, view orders etc. operation. He can control the whole system. After the performance of the role of the admin, a customer has to register or login in the system. After a successful log in, a customer can choose restaurant, food items, order food and do payment. After the confirmation of food order, the cook will be started cooking the dis and the waiter will serve the food.

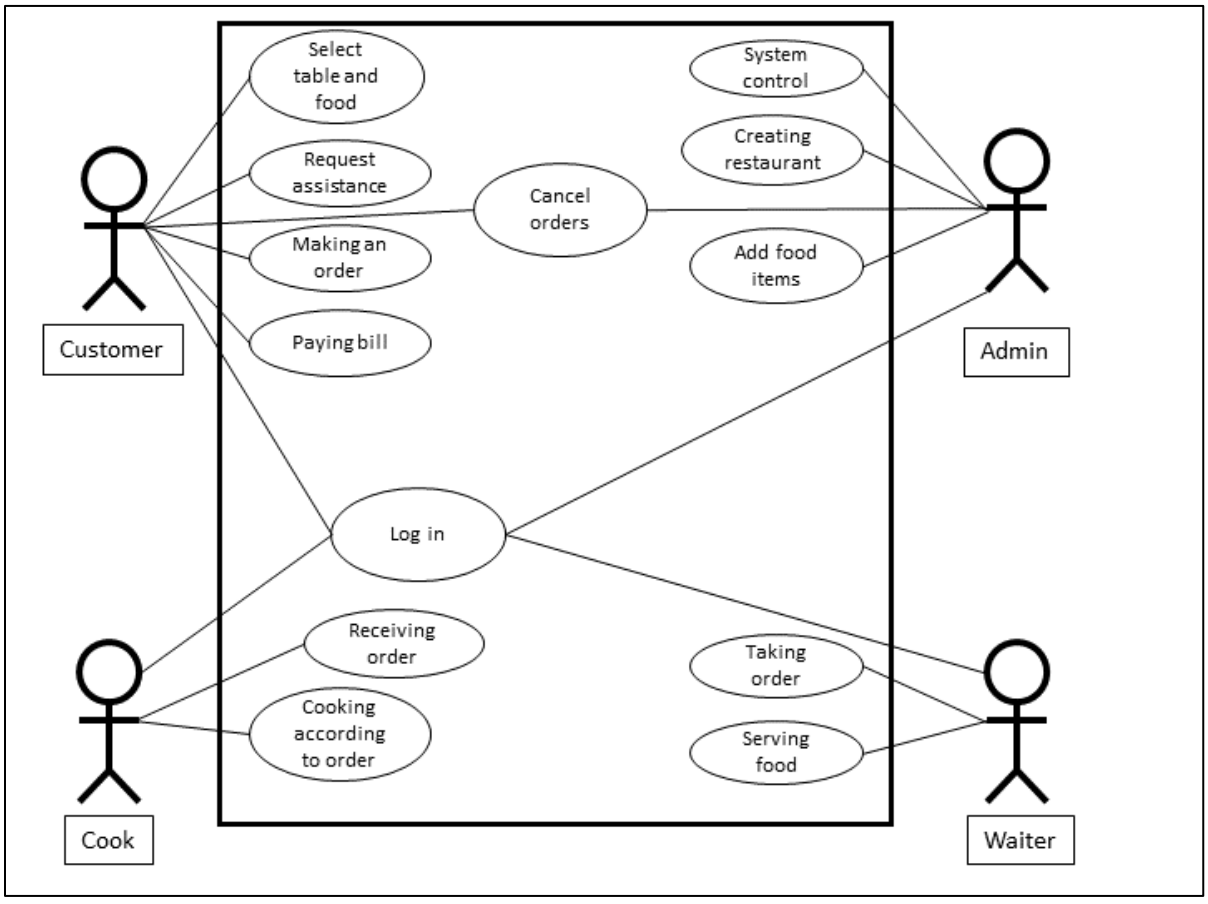



Figure 3.3.1: Use Case Modeling and Description

This is our use case model. Here we can see that, customer, admin, cook, waiter everyone needs to log in first. Admin controlling the system and customer paying the bill.

## 3.4 Logical Data Model

A logical data model is a non-database model that explains the items that an organization wants to gather data about, as well as the relationships between them. A logical model includes entity and attribute representations, relationships, unique identifiers, subtypes and supertypes, and relationship restrictions. The logical data model shows that every targeted data is stored in the database and user can access the provided data through the application

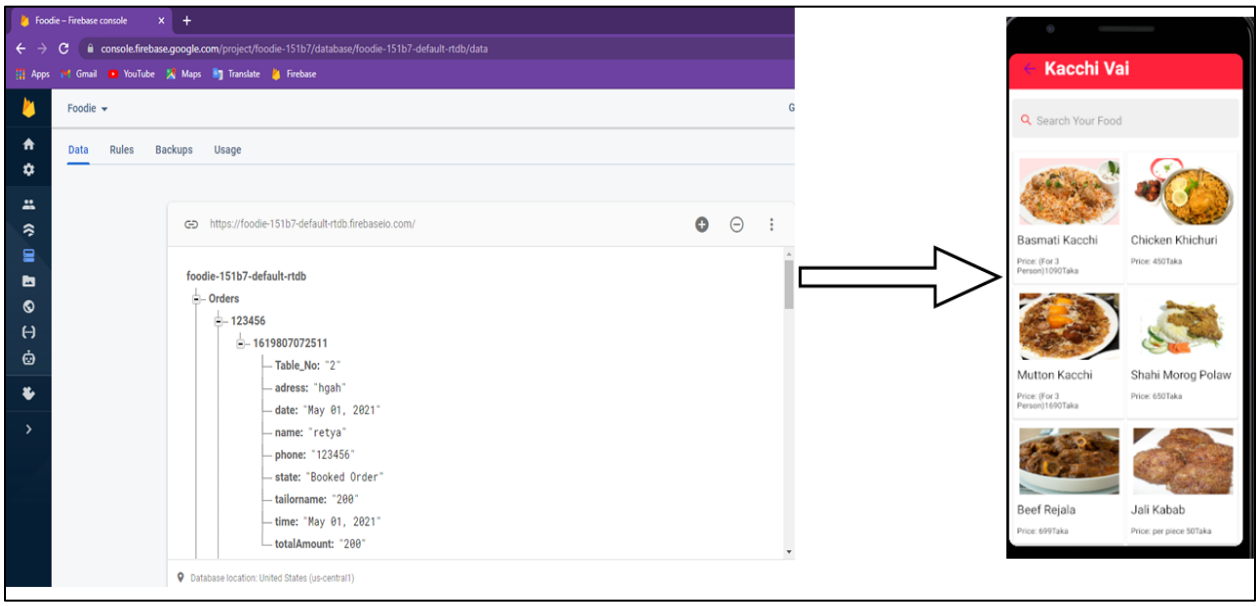



Figure 3.4.1: Logical Data Model

This logical data model represents our database connection with our project. We use firebase database system for this requirement.

## 3.5 Design Requirements

For an Android application, design requirements are critical. The user interface of the application must be appealing and easy to use in order to persuade the user to utilize it. So, in order to finish the design, we'll need to develop a website and an Android app skill. To do so, we'll need to be familiar with a variety of programming languages. We must create the design. database in order for it to function effectively and efficiently.

# CHAPTER 4

# Design Specification

## 4.1 Front-end Design

Everything a user sees on a mobile app, including the design, is referred to as the front end. Simply defined, the user interface of a mobile app is what the user sees. The front end is where the user experiences and interacts with these things. As a result, we have created a user-friendly, simple-to-use, and smoothly-functioning Front-end. This program is simple enough for any customer to use. In order to design our application, we employed certain Front-end technology. For front end design we just used basic android xml and java code, fragments. To connect fragment code with other activity or model we used adapters. Beside this, Toasty, Rounded Image View, Circle Image View Glide etc. GitHub libraries and Material Design for UI & UX for android application [4].

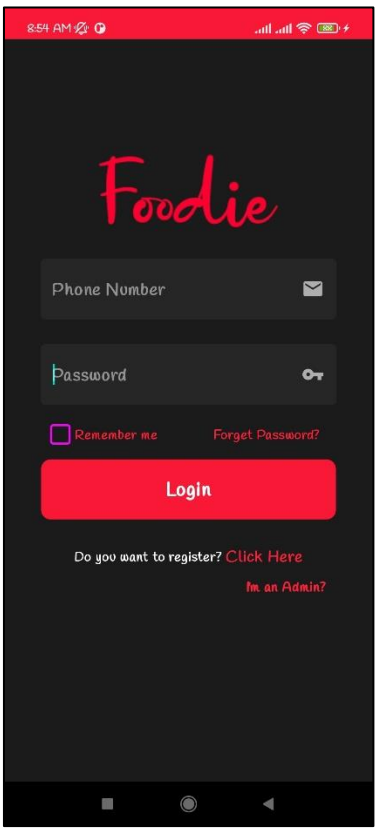



Figure 4.1.1: Front-end Design (User)

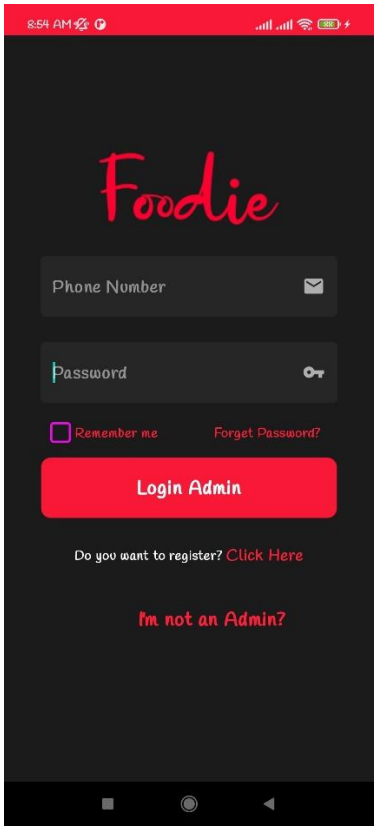



Figure 4.1.2: Front-end Design (Admin)

## 4.2 Back-end Design

A backend enables you to add features such as cloud data backup, content delivery to client apps, real-time interactions, push alerts using Google Cloud Messaging for Android (GCM), and more. The term "back-end" refers to the server-side rendering. An application, a server, and a database make up the back-end. The database we utilized was Firebase. We also used some dependencies, some methods like, on-Create method, on-Click method, Navigation View, start–stop method, Recycle View method etc [5].

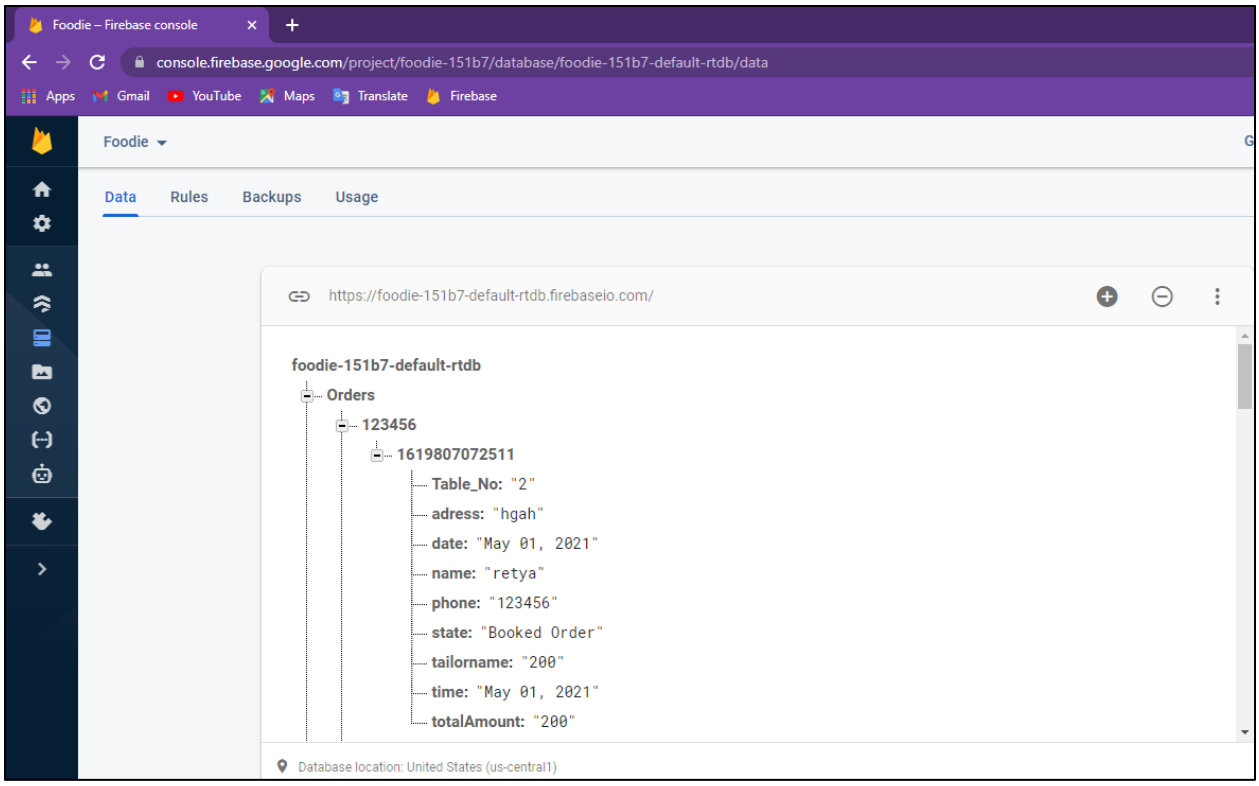



Figure 4.2.1: Back-end Design

This is the window of our Realtime database which we used in our project as a back-end design.

## 4.3 Interaction Design and UX

We've tried to keep the UX design of our application as simple as possible, and not mention that our app is fully responsive. We searched the internet, visited numerous websites, and used a variety of Android applications. Then we created the user experience design for our app. [2]

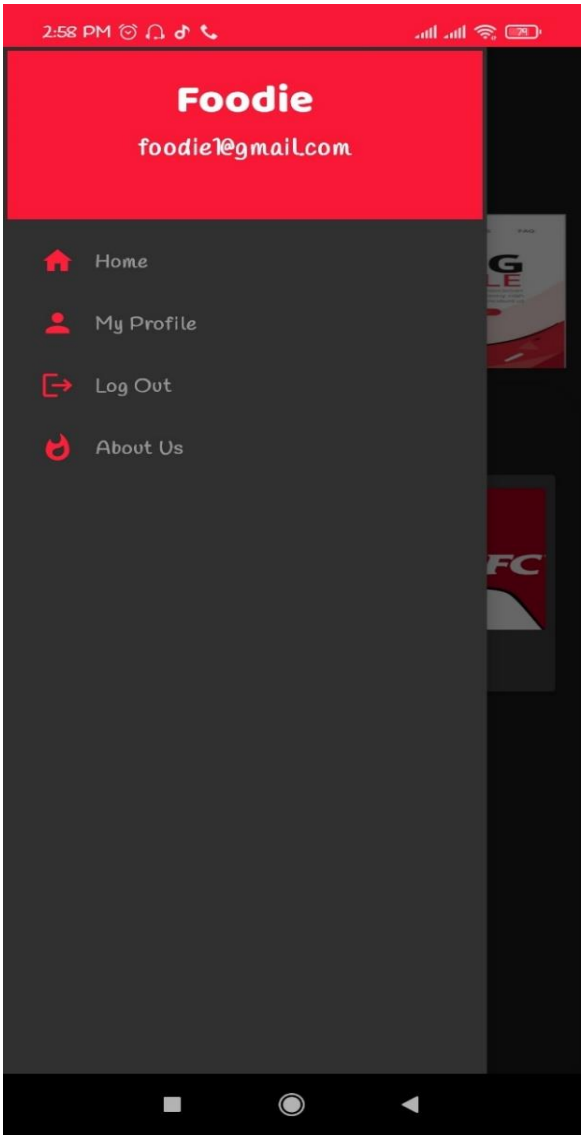



Figure 4.3.1: Interaction Design and UX (Menu bar)

This is the menu bar page of our project. This page has Home menu, My profile menu, Log out menu and About us menu.

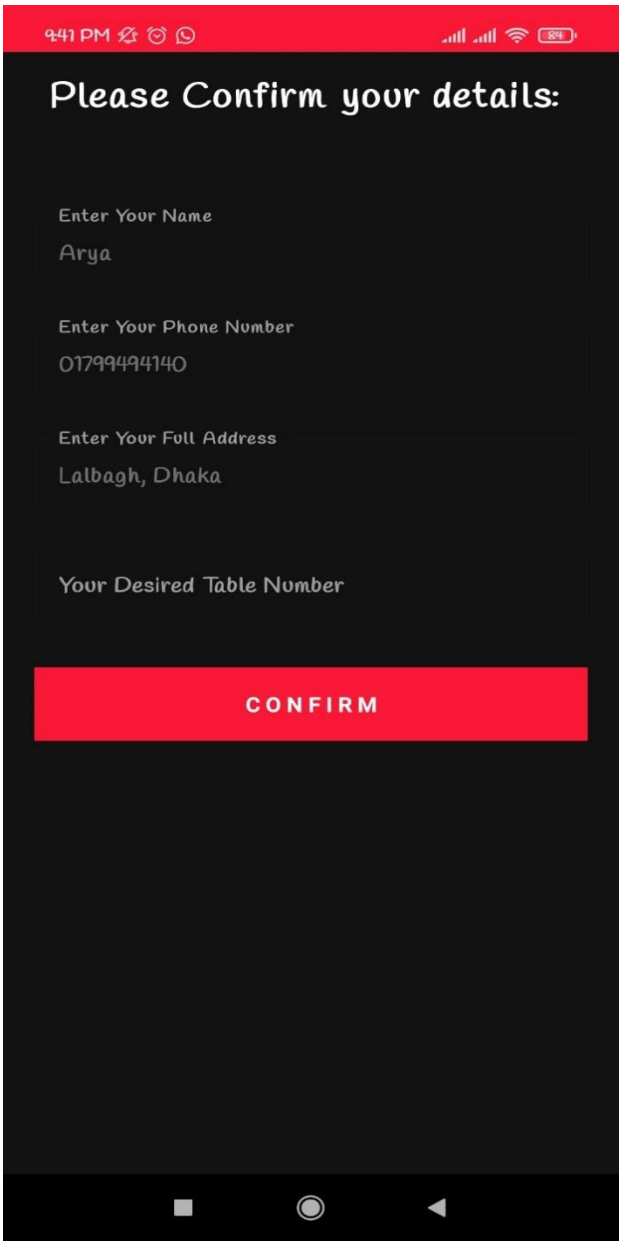



Figure 4.3.2: Interaction Design and UX (Order confirmation page)

This is the order confirmation page. It has some input files for ordering food.

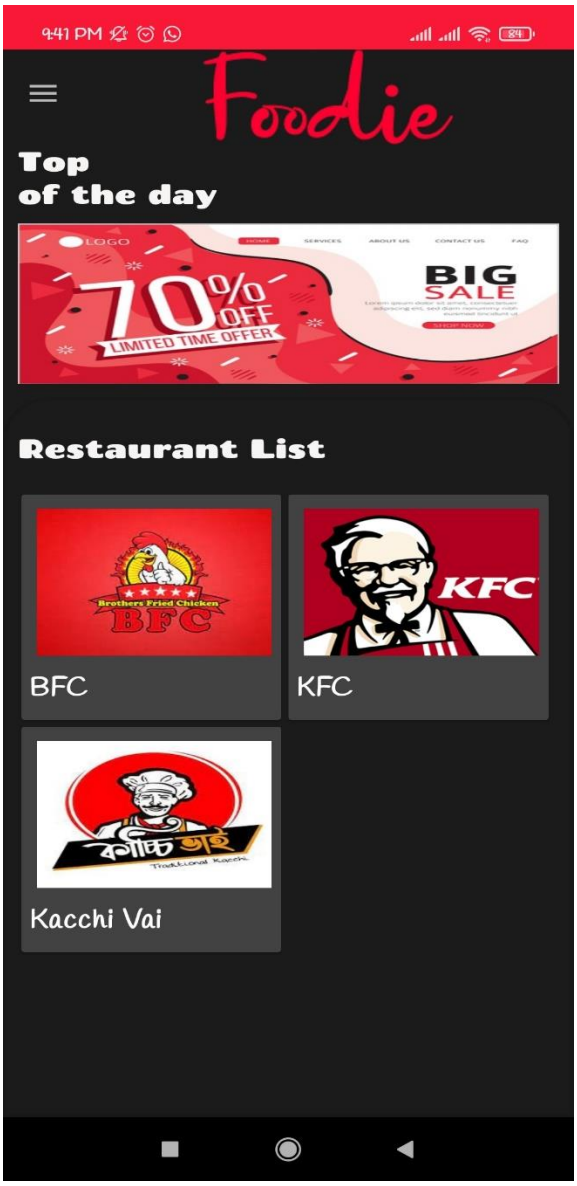



Figure 4.3.3: Interaction Design and UX (Home page)

This is our Homepage which has restaurant list. Admin can add or remove restaurants in this page.

## 4.4 Implementation Requirements

It was our first time working on a service project. As a result, we had to learn a lot of new technologies and put in a lot of effort to meet all of the needs.

# Chapter 5

# Implementation and Testing

## 5.1 Implementation of Database

Any type of software application requires database design and execution as a foundation. Firebase is a Real time database management technology that we utilized. We provide data from the database in json format to the android application.

Figure 5.1.1: Implementation of Database

### 5.1.1 Database Authentication:

For the authentication of the database with android app some steps will be followed. These steps are given below:

1. Firstly, we selected the Tools option from Menu >> Select the Firebase option.
2. On the right-hand side, there was opening the Assistant Tab, where we could select options based on our needs. We had chosen the Authentication option.
3. We had two options after clicking on any of the options: connect the app to Firebase and add dependencies to the project.
4. The dialogue box appears when we clicked the button to connect to the firebase from step 3. These dialogue boxes were, “Connect to Firebase” and “Add Firebase Authentication to your app”
5. Then we created a new Firebase project named “Foodie”.
6. After giving the project a name and we clicked the Connect to Firebase button.
7. After connecting to Firebase, we needed to set up dependencies. To do so, we used the second option to add dependencies.
8. When we clicked that, we saw a dialogue window, and we had to select Accept Changes.
9. We saw the changes in the .gradle file after connecting Firebase to the Android project.
10. To see if google-services.json had been added to the project, go to Project Files and then to the app folder, where we found google-services.json [9].

Finally, the Firebase database was connected with the project. These are the required steps for the connection between database and an android project. This is the authentication way of firebase and android.

## 5.2 Implementation of Front-end Design

Visualization is so vital to users, as a result, front-end design is essential. We must always consider a seamless and user-friendly front-end while developing a design for an Android application. [5] It's challenging to create the perfect design that appeals to everyone because everyone's taste and preferences are different. We have, however, made every effort to make our front-end as user-friendly as possible.

**Registration view:**

- This page comes before the log in view to ensure the customers registration.
- In registration view, we just have an app logo and necessary input fields for taking information from users and a register button.

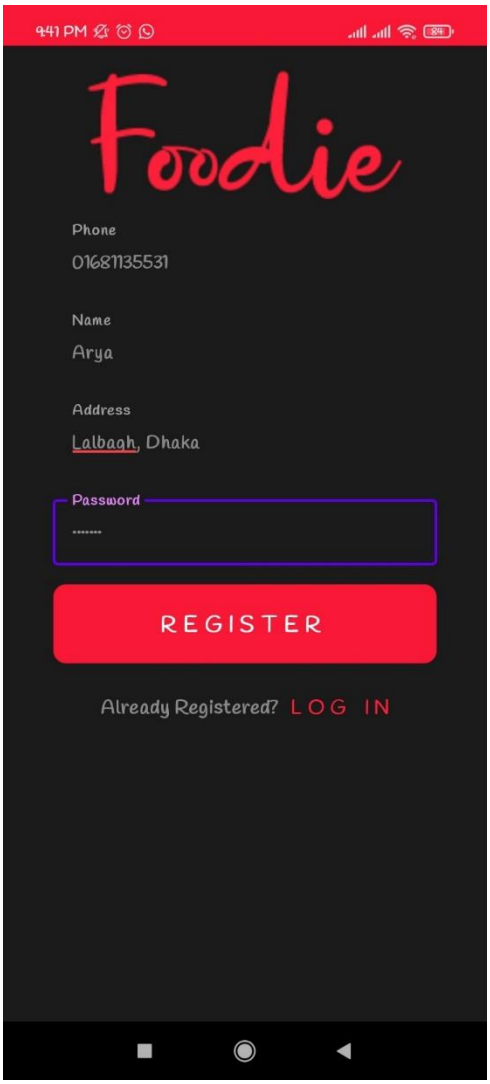



Figure 5.2.1: Implementation of Font-end Design (Registration page)

**Log in view:**

- This page is for the first-time users of this application.
- It helps the customer to log in by taking essential information that are needed to successfully complete the log in sequence.
- This page contains the title, logo, a login button, are all shown in the login screen
- Admin log in page has admin log in button [7].
- There is a check box named remember me and a forget password option.

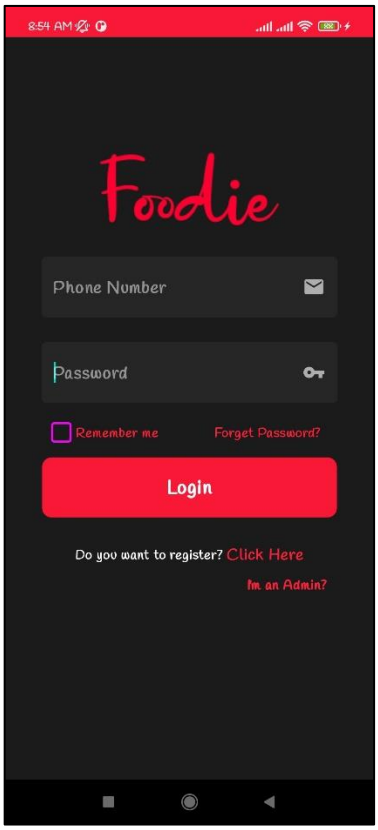



Figure 5.2.2: Implementation of Font-end Design (User Log In page)

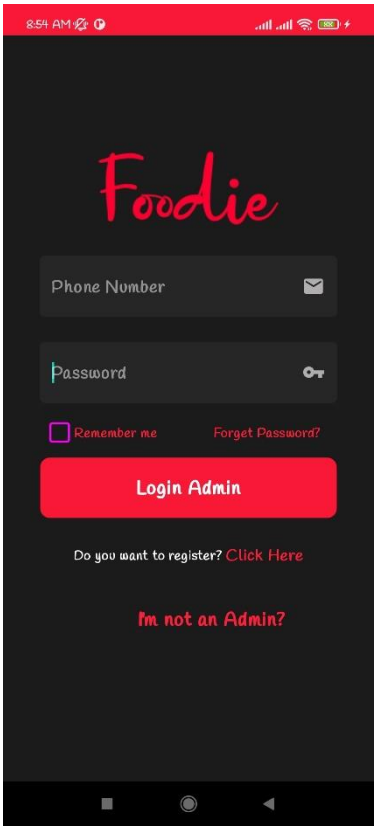



Figure 5.2.3: Implementation of Font-end Design (Admin Log In page)

**Homepage view:**

- The homepage deals with the first interaction of the application with the user.
- It shows all the restaurant list, app logo, and sales add.

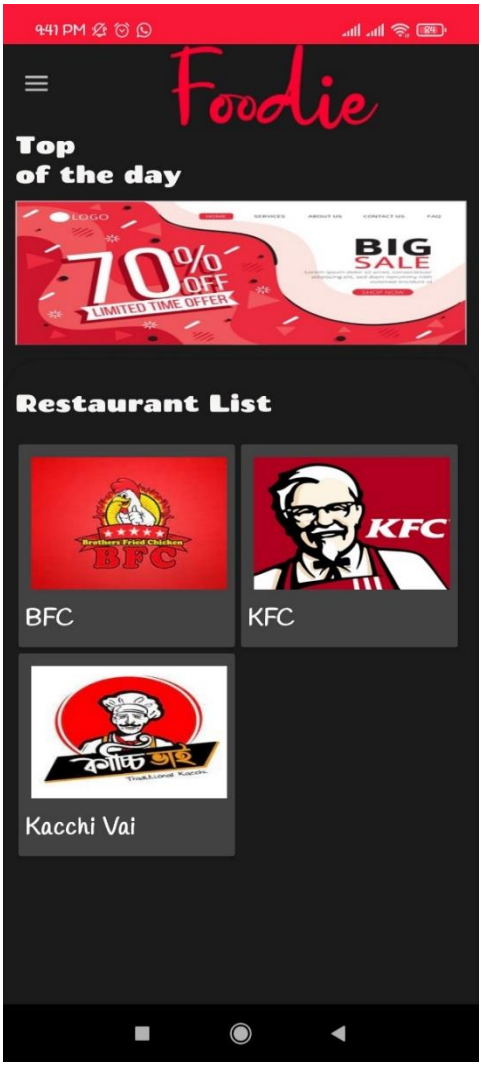



Figure 5.2.4: Implementation of Font-end Design (Home page)

**Menu Bar view:**

- The menu bar view shows the menu list or, various other features of the application [8].
- The menu bar view shows some menu list, like, about home, my profile, about us, log out.

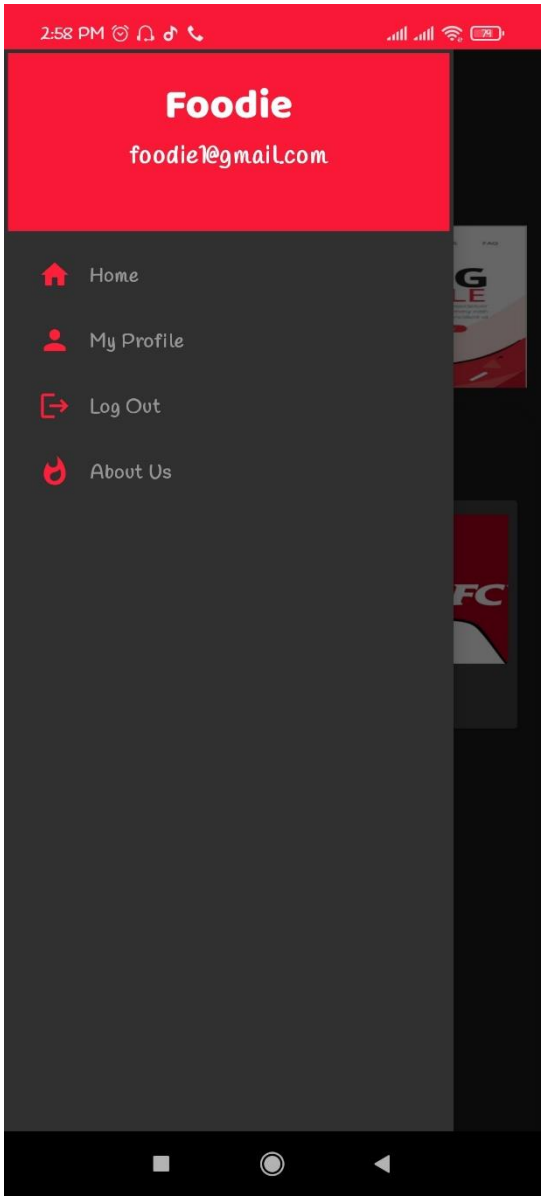



Figure 5.2.5: Implementation of Font-end Design (Menu bar page)

**Restaurant Page:**

- This page is for the menu of the restaurant.
- It contains all the food items available at that time at the restaurant

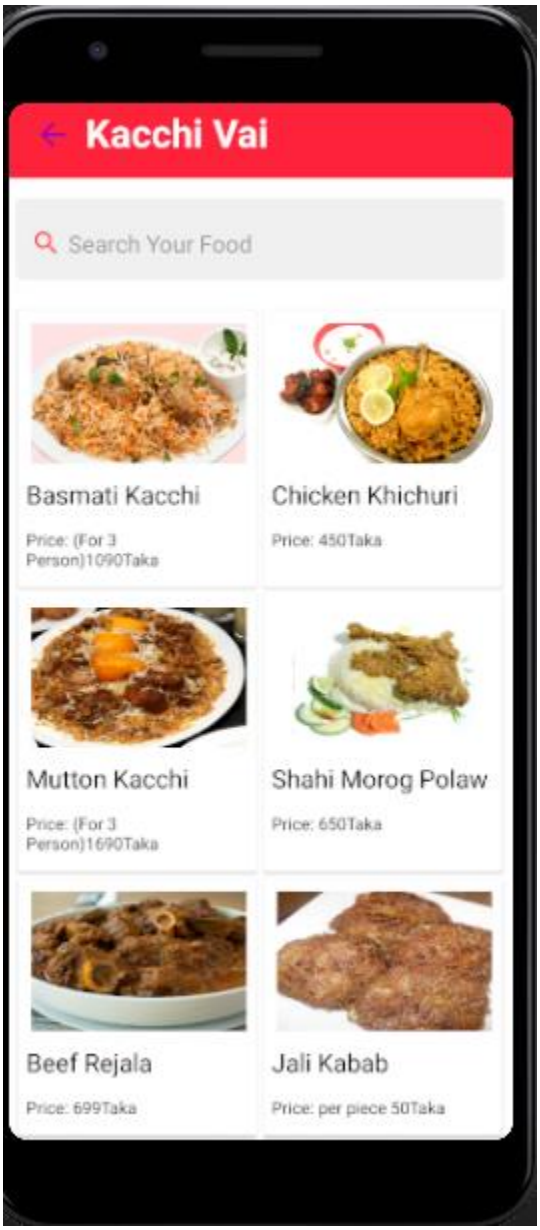



Figure 5.2.6: Implementation of Font-end Design (Restaurant page)

**Confirm food item page:**

- This page has the information fields for the confirmation of food items.
- It shows the customer's information to make everything sure

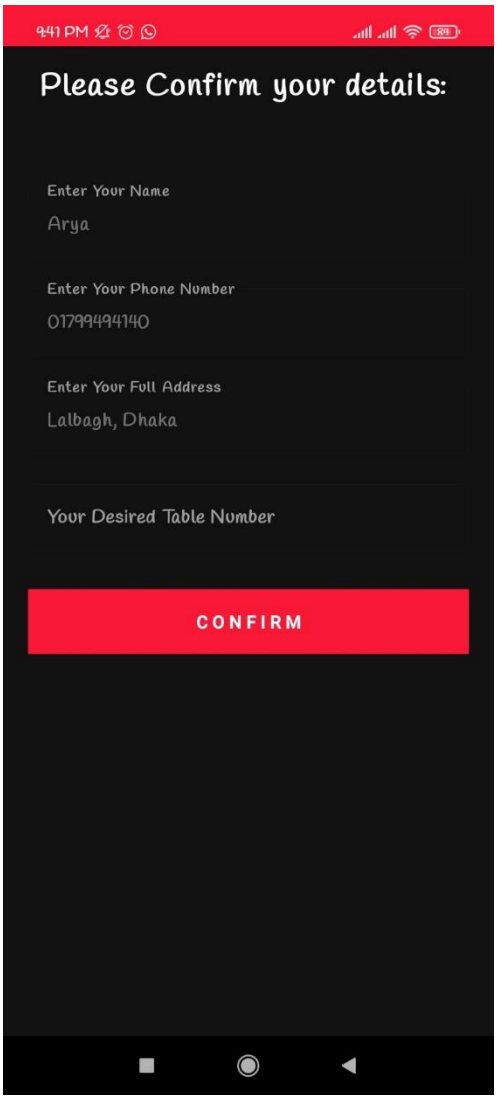



Figure 5.2.7: Implementation of Font-end Design (Order confirmation page)

**Payment method page view:**

There is two type of payment methods. One is digital payment and the other one is cash on payment method.

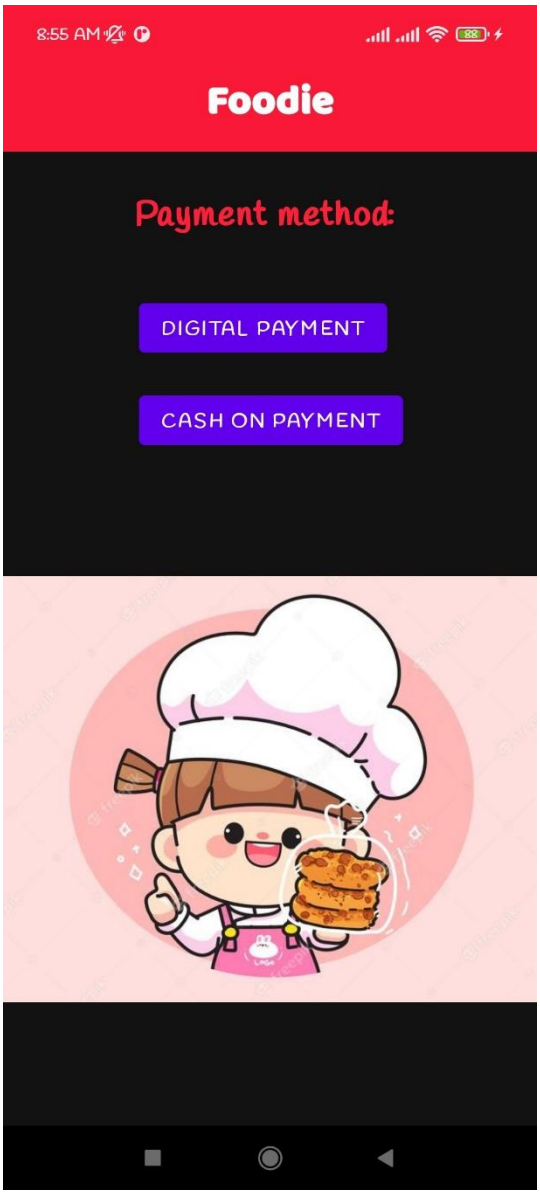



Figure 5.2.8: Implementation of Font-end Design (Payment method page)

**Digital payment page view:**

It is a QR code scanner page. This page can scan the QR code from any payment apps. [6]

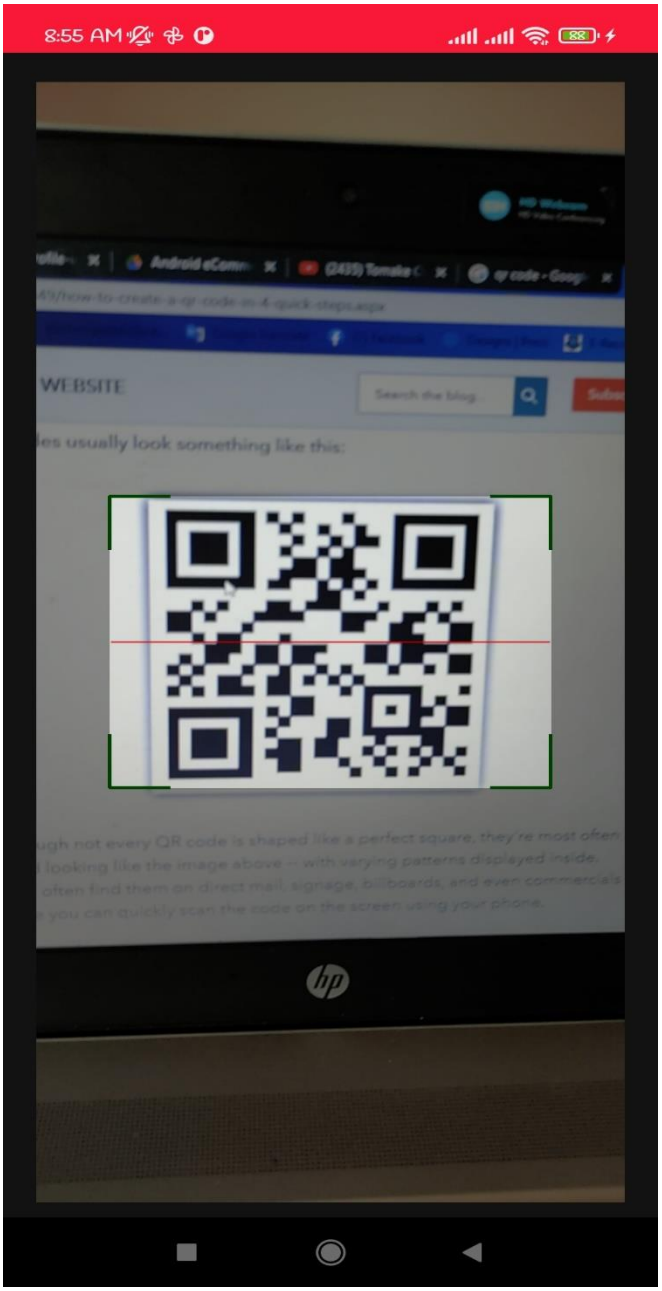



Figure 5.2.9: Implementation of Font-end Design (QR scanner page)

**About us page view:**

This page has app title, our supervisor's information and our team-mates information.

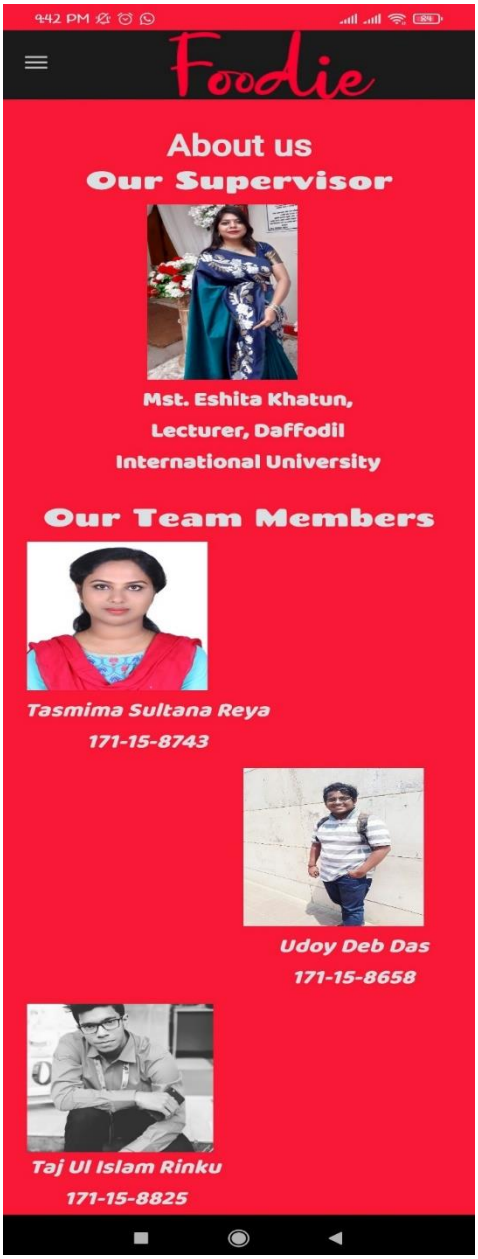



Figure 5.2.10: Implementation of Font-end Design (About us page)

## 5.3 Implementation of Interactions

### Password and Confirm Password Error Validation

When a user enters an incorrect password in the “password” and “confirm password” fields, the user will be redirected to a page with an error.

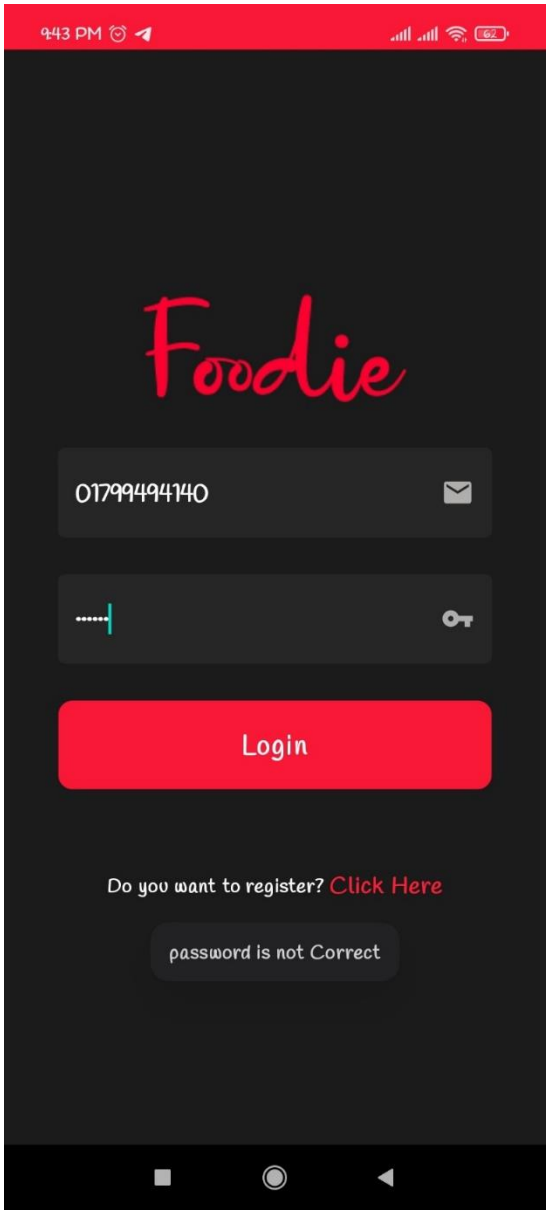



Figure 5.3.1: Password and Confirm Password Error Validation

### Add new restaurants and menu

Admin can add restaurants and food menu from this page. He also can delete those things.

A text message will be shown during the log in of an admin just like the below image.

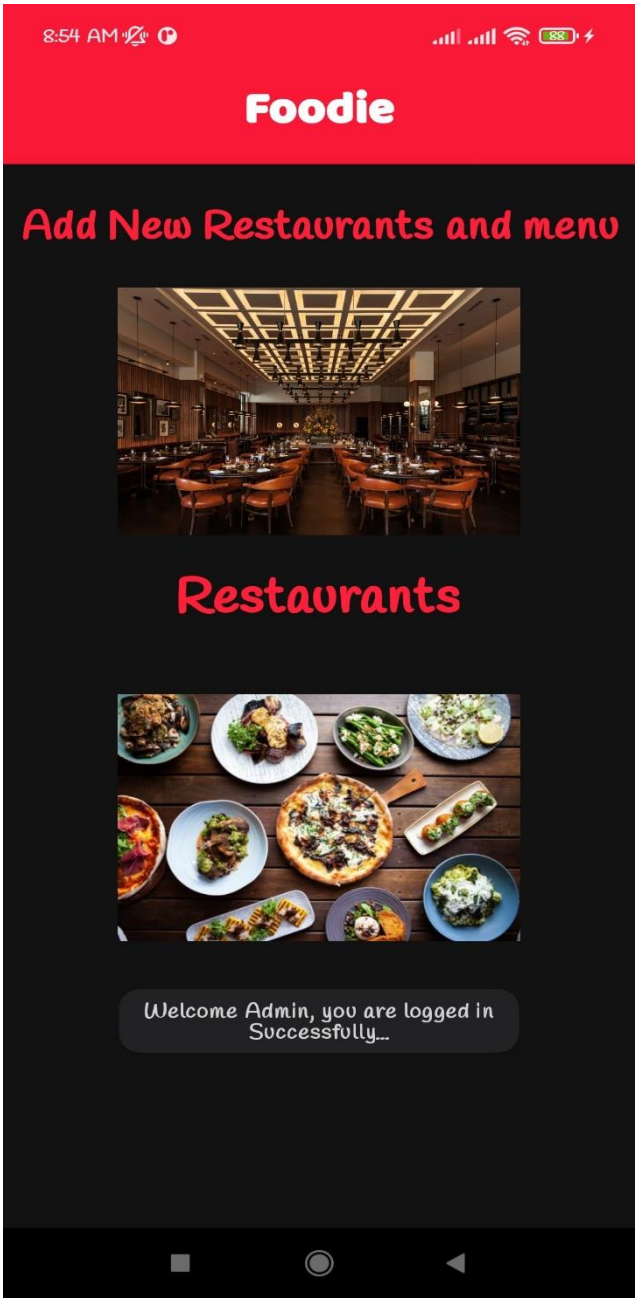



Figure 5.3.2: Add new restaurants and menu items page

**Restaurant adding page**

Admin can add restaurants through this process. At firsts he will give the restaurant name, place, restaurant description and the agreement with the restaurant. Here also a text message will be shown to the admin.

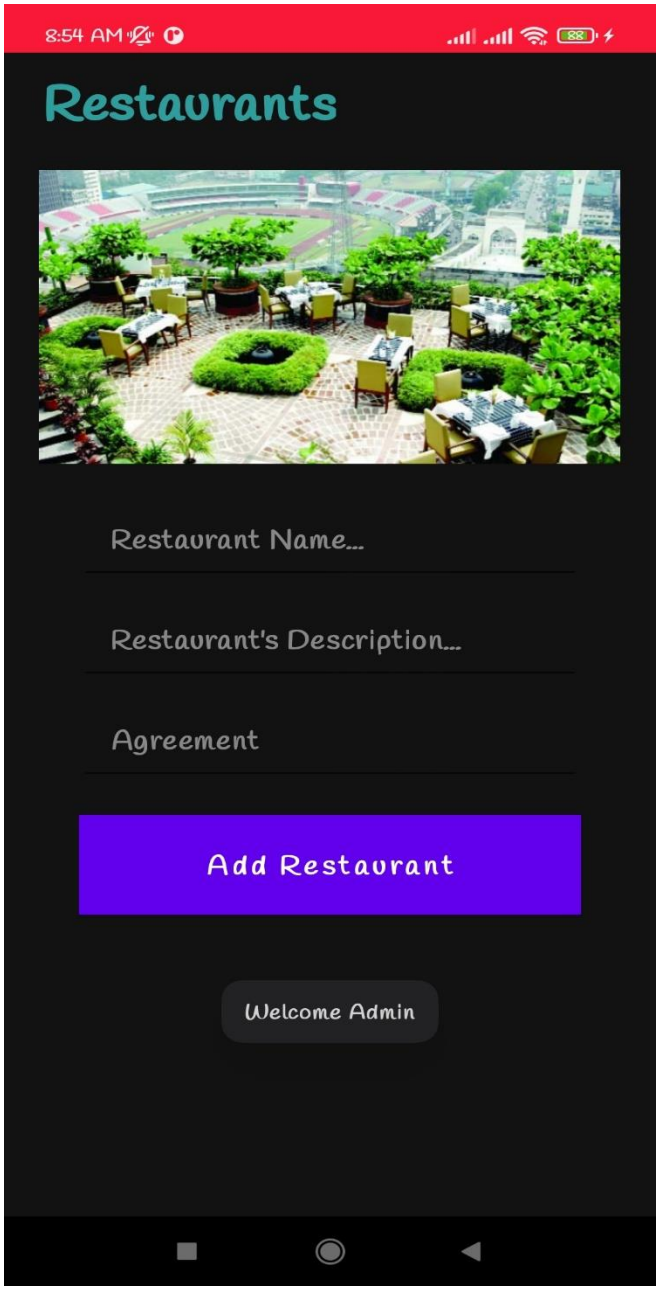



Figure 5.3.3: Adding new restaurant with details process.

## 5.4 Test Results and Reports

**View order and booking request:**

Admin can view the booking and order request from the customer. This is the figure of database from admin view.

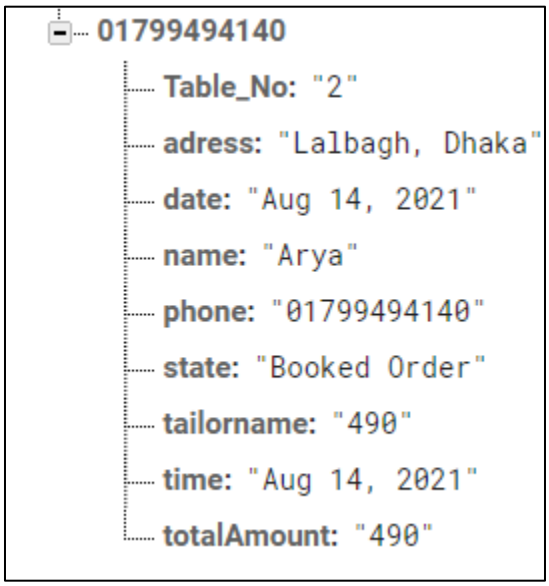
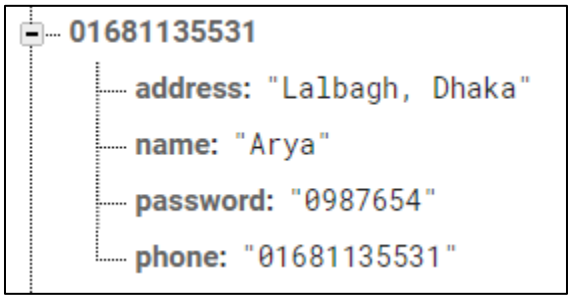



Figure 5.4.1: View order and booking request

**User Info & Management (Admin) View:**

Only the admin has access to all user information, with the exception of the password, and can manage roles.



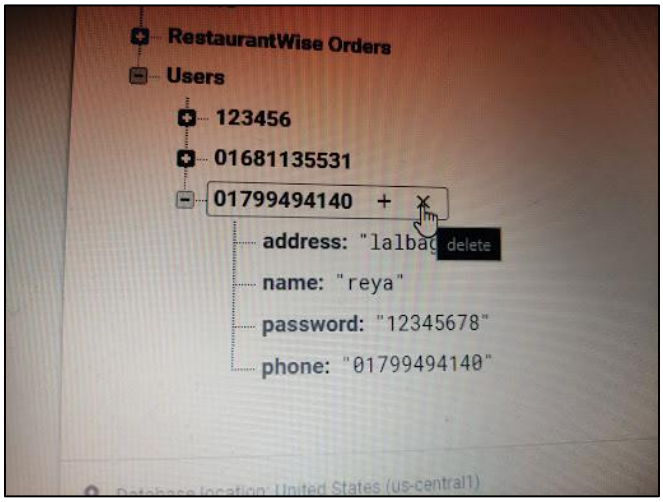




Figure 5.4.2: User Info & Management (Admin) View

# CHAPTER 6

# Conclusion and Future Scope

## 6.1 Discussion and Conclusion

In this age of technological development, both the diseases and their cures are getting stronger day by day. Not only for COVID-19, in any type of pandemic the most common way to have a huge mass of population effected is by human-to-human physical interaction. To prevent that to some extend this project will have a big effect. As this system is designed with the goal of preventing direct contact between human while keeping their daily work untouched. This system will provide that needed assurance of safety.

## 6.2 Scope for Further Developments

No system is complete. Every system will have at least one spot which has to be worked on. If not, then the system needs to be at least upgraded to meet the ever-growing demand raised by its users. The same goes for our system. We could not develop or, add some key feature in this project as we intended, due to inexperience, lack of knowledge and most importantly lack of time and proper communication. In future we will develop the following features,

- Adding artificial intelligence or, AI assistant to the system where the app can use a common assistant and a huge individual database.
- Different AI assistant for different environment. For example, when a restaurant adapts our system, we wish to provide different assistant to every table. So, the customers either can use the menu from the application or, can command the AI to order for them.
- The AI being able to conduct small talks with the customer. Like answering the questions that are being asked by the customer and so on.
- Adding a carrier robot to the system replacing the waiters where the human interaction is being fully eliminated.
- The AI being able to identify the robot as its physical body.

- Most importantly we want this system to be used in every official situation. For the sake of this project, we had to direct in one industry but we can see the system being adapted by every office as no one wants to put the regular progression of their work to a halt.

These are the developments we wish to add to our project in the near future.

# Reference:


[1] R. V. Ravi, A. N.R., A. E., H. P. and J. T., "An Android Based Restaurant Automation System with Touch Screen," 2019 Third International Conference on Inventive Systems and Control (ICISC), 2019, pp. 438-442, doi: 10.1109/ICISC44355.2019.9036365. [Accessed: 08- April- 2021].

[2] X. Hongzhen, T. Bin, and S. Wenlin, “Wireless food ordering system based on web services,” in Intelligent Computation Technology and Automation, 2009. ICICTA’09. Second International Conference on, vol. 4. IEEE, 2009, pp. 475–478. [Accessed: 08- April- 2021].

[3] Muneer, H., 2021. GitHub - harismuneer/Restaurant-Management-System: An Android based RMS that aims to digitalize the day-to-day processes of various restaurant operations including ordering, billing, kitchen, hall and inventory management. [online] GitHub. Available at: <https://github.com/harismuneer/Restaurant-Management-System> [Accessed 15 May 2021].

[4]"What is Front End for Mobile App?", *GoodFirms Glossary - GoodFirms*, 2021. [Online]. Available: https://www.goodfirms.co/glossary/front-end/. [Accessed: 08- Jun- 2021]

[5] Kotwani, S., 2021. *Adding a Backend to Your App In Android Studio*. [online] Android Developers Blog. Available at: <https://android-developers.googleblog.com/2013/06/adding-backend-to-your-app-in-android.html> [Accessed: 08- Jun- 2021].

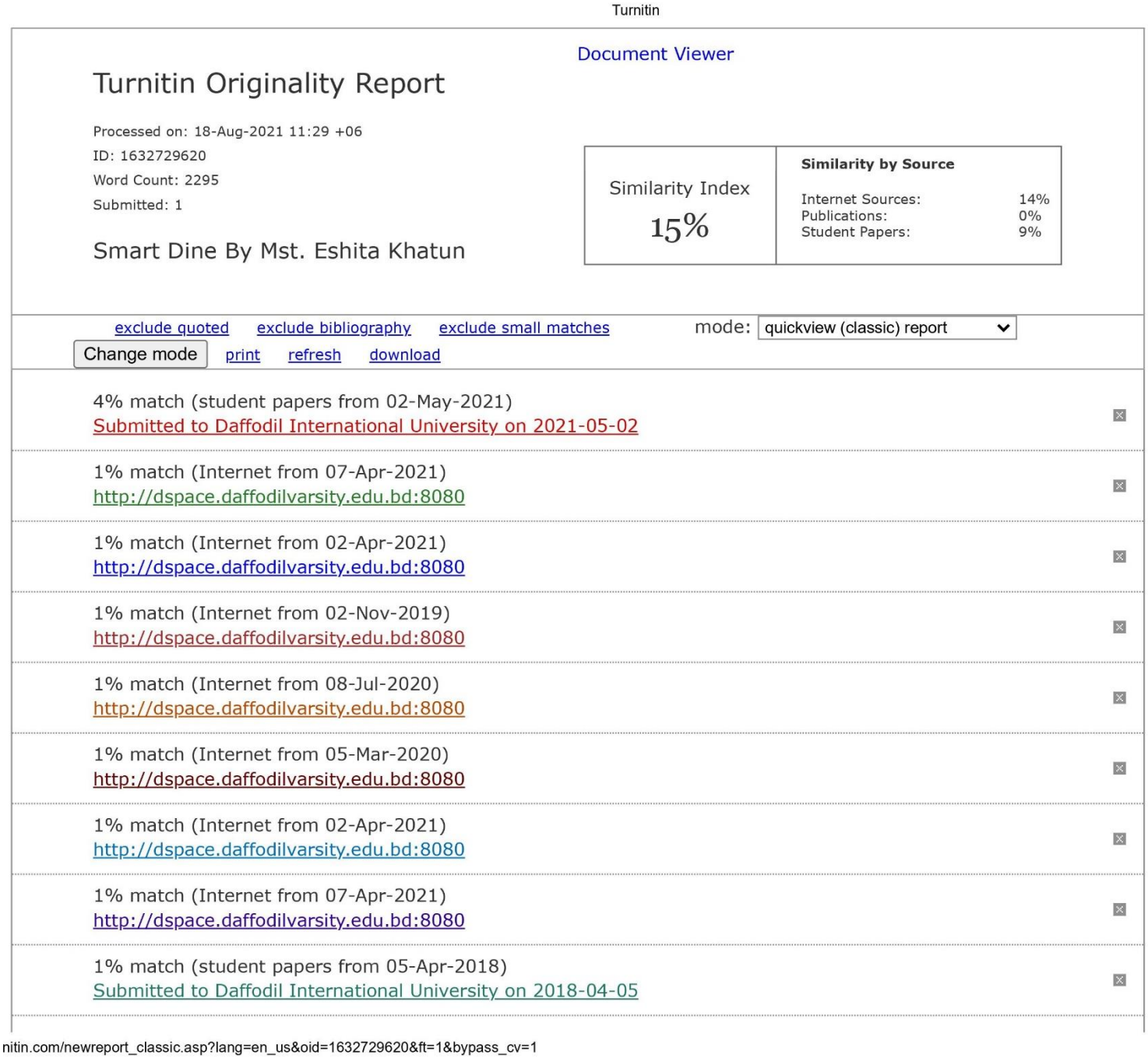
[6] 2021. [image] Available at: <https://www.youtube.com/watch?v=AiNi9K94W5c> [Accessed 7 June 2021].

[7] flow, C., 2021. *Radio Buttons & Radio Group Tutorial*. [online] Gist. Available at: <https://gist.github.com/codinginflow/13a0eab9e17361e53e899b98a9271c30> [Accessed 8 June 2021].

[8] Material Design. 2021. Material Design. [online] Available at: <https://material.io/design> [Accessed 13 July 2021].

[9] Mishra, S., 2019. Firebase Login and Authentication: Android Tutorial. Available at: https://blog.mindorks.com/firebase-login-and-authentication-android-tutorial [Accessed July 21, 2021].

## Plagiarism Report:



<1% match (Internet from 07-Apr-2021)
http://dspace.daffodilvarsity.edu.bd:8080

<1% match (Internet from 07-Apr-2021)
http://dspace.daffodilvarsity.edu.bd:8080

<1% match (Internet from 02-Apr-2021)
http://dspace.daffodilvarsity.edu.bd:8080

<1% match (Internet from 07-Apr-2021)
http://dspace.daffodilvarsity.edu.bd:8080

<1% match (Internet from 07-Apr-2021)
http://dspace.daffodilvarsity.edu.bd:8080

<1% match (Internet from 07-Apr-2021)
http://dspace.daffodilvarsity.edu.bd:8080

<1% match (Internet from 07-Apr-2021)
http://dspace.daffodilvarsity.edu.bd:8080

<1% match (Internet from 07-Apr-2021)
http://dspace.daffodilvarsity.edu.bd:8080

<1% match (student papers from 31-Mar-2019)
Submitted to Daffodil International University on 2019-03-31

<1% match (student papers from 03-Apr-2019)
Submitted to Daffodil International University on 2019-04-03

<1% match (student papers from 24-Nov-2018)
Submitted to Daffodil International University on 2018-11-24

<1% match (student papers from 02-Apr-2019)
Submitted to Daffodil International University on 2019-04-02